

**SUMMARY
OF
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENTAL MANAGEMENT PLAN**

**FOR
EXPANSION OF
CEMENT & CLINKERIZATION PLANT
FROM
2600 TPD (0.858 MTPA) TO 4500 TPD (1.485 MTPA)
WITH 10 MW CPP AND 9.5 MW WHRS
AT
VILLAGE THANGSKAI, P.O. LUMSHNONG,
DISTRICT EAST JAINTIA HILLS, STATE MEGHALAYA**

(Land Area: 94.20 ha)

***Project Proponent:*
M/s. Meghalaya Cements Limited**

**Registered office: Village Thangskai, PO. & PS. Lumshnong
District : East Jaintia Hills, Meghalaya-793210
Email: meghalaya@topcem.in**

ToR Granted: Letter No. IA-J-11011/275/2022-IA-II(IND-I) dated 18.08.2022

**BASELINE DATA PERIOD: 1ST MARCH 2022 TO 31ST MAY 2022
COLLECTED BY: MIN MEC R & D LABORATORY, NEW DELHI
(NABL Certificate No. TC-6337 and
MOEF&CC Recognition vide Gazette No. SO 3744(E) at Sl. No. 97)**

ISSUE 1 REV. 0 JANUARY 2023, (UID No. 202301002)

Prepared by:



Estb. 1983

MIN MEC CONSULTANCY PVT. LTD.

**A-121, Paryavaran Complex, IGNOU Road, New Delhi – 110 030
Ph : 91-11-29532236, 29535891; 29532568, Web site: <http://www.minmec.com>
Email: mining@minmec.com; minmec@gmail.com**



**An ISO 9001:2015
approved company**

Accredited by NABET, QCI vide Certificate no. NABET/ EIA/2225/IA 0096 valid till 29.03.2025

CONTENTS

Sl. No.	Description	Page No.
1.0	Introduction	1
1.1	General background.....	1
1.2	Location and communication.....	1
2.0	Project description.....	1
2.1	Plant layout	1
2.2	Process Description	2
2.3	Raw material, power and water.....	2
2.4	Manpower	2
2.5	Site services	4
3.0	Present environmental scenario.....	4
3.1	Topography and drainage	4
3.2	Climate and micro-meteorology	4
3.3	Ambient air quality.....	6
3.4	Water resource and quality	6
3.5	Land use pattern and soil quality.....	6
3.6	Noise and traffic volume survey	7
3.7	Ecology	7
3.8	Socio-economic conditions.....	7
3.9	Places of archaeological/ historical/ tourist/ religious importance.....	7
3.10	Industries around the project area.....	8
4.0	Environmental impact assessment and mitigation.....	8
4.1	Topography and drainage	8
4.2	Climate & Meteorology	8
4.3	Air quality	9
4.4	Noise and traffic density.....	9
4.5	Water environment.....	9
4.6	Land use	10
4.7	Soil quality	10
4.8	Solid waste	10
4.9	Ecology	11
4.10	Socio-economics.....	11
4.11	Occupational Health.....	11
5.0	Analysis of alternatives.....	11
6.0	Environmental monitoring program	12
7.0	Additional studies: disaster management plan	12
8.0	Project benefit	12
9.0	Environment management plan.....	13
10.0	Disclosure of consultants	14
11.0	Conclusion	14

1.0 INTRODUCTION

1.1 General background

M/s Meghalaya Cement Limited (MCL) has a large integrated cement plant located in Meghalaya at Village Thangskai, District East Jaintia Hills with a clinkerization capacity of 0.858 million tonnes per annum (MTPA), cement capacity to 0.858 MTPA and a 10 Mega Watt Captive Power Plant. The construction of Meghalaya Cement was started around 2004. In 2006, first clinker and cement were produced. Initially the plant was designed to produce about 900 tonnes per day (TPD) of clinker and corresponding cement. MCL initiated a capacity augmentation project in 2009 which was completed in 2010. The augmented clinkerisation and cement capacity became 2600 TPD (0.858 MTPA).

The 0.858 MTPA existing project was accorded Environment Clearance from State Environment Impact Assessment Authority, Shillong vide No. SEIAA/Project-2/2007-18 dated 25.03.2009 and amendments dated 29.06.2017, 30.04.2019, 19.08.2019, 12.09.2019 & 30.09.2020. Now, it is proposing to enhance the capacity of the plant. The configuration after expansion will be clinker 1.485 MTPA (4500 TPD), cement 1.485 MTPA (4500 TPD) and Waste Heat Recovery System of 9.5 MW.

1.2 Location and communication

The existing and proposed expansion plant is located at Village Thangskai, District East Jaintia Hills. The location of plant is shown in **Fig 1**. The latitude and longitude of the the plant based on Google earth are:

Latitude : 25°11'59.96" to 25°12'39.67" North
Longitude : 92°23'16.2" to 92°23'18.9" East

The site is well connected to NH-6 which is approximately 0.15 kilometer (km) in west direction from the plant site. The nearest Railway station is Karimganj Railway Station at 37.5 km. The nearest airport is Shillong, approximately 67 km aerially and 118 km by road in north west direction from the plant site.

2.0 PROJECT DESCRIPTION

2.1 Plant layout

Total land for the entire project is 94.20 hectare (ha). Out of this total land, 15.389 ha shall be under plant area, 4.358 ha for captive power plant area, 4.483 ha for shed area, 2.945 ha for colony area, 2.187 ha for ABCD residential area, 7.336 ha for road area, 5.618 ha for truck parking, 31.086 ha for greenbelt and 20.798 ha for others. 33% of plot area will be proposed for development of green belt and plantation.

2.2 Process Description

Clinker and Cement Production: Cement manufacturing process involves receiving limestone from mine, other raw material and fuel from mines/ open market, crushing, grinding, blending of raw meal, calcining the materials in a rotary kiln, cooling the resulting clinker, mixing the clinker with gypsum or fly ash, milling, storing, and bagging the finished cement.

The raw materials used to make cement may be divided into four basic components: lime (calcareous), silica (siliceous), alumina (argillaceous), and iron (ferriferous). The basic chemistry of the cement manufacturing process begins with the decomposition of clay minerals into silicon dioxide and aluminium oxide and decomposition of calcium carbonate at about 900 degree centigrade to leave calcium oxide (lime) and liberate carbon dioxide.

The two products manufactures will be Portland Pozzolana Cement using fly ash and Ordinary Portland Cement using gypsum with clinker. Cement shall be sold in the market.

Power Generation: The existing plant has electrical energy from State Electricity Board, Captive Power Plant (10 MW capacity) and Waste Heat Recovery System (9.5 MW). Waste heat from exhaust gases of preheater and grate cooler is utilized for power generation. Preheater exit gases after Waste heat recovery boiler outlet shall be utilized for material drying in coal mill (Vertical Rolling Mill) and raw mill (Vertical Rolling Mill).

2.3 Raw material, power and water

Major raw material and fuel requirement for project are limestone (captive mines), clay (Brichyrrnot in Meghalaya), coal/ pet coke (Coal India Limited and its subsidiaries), laterite (Barak Valley Area in Assam), alternate fuel (Guwahati/ Shillong), clinker (inhouse), flyash (West Bengal Power Development Corporation Limited/ NTPC Kahalgaon/ own captive power plant), mineral gypsum (State Mining Co. Ltd., Bhutan) and performance improver (East Jaintia Hills). Total raw material required for the plant will be 61.62 Million Tonnes Per Annum (MTPA).

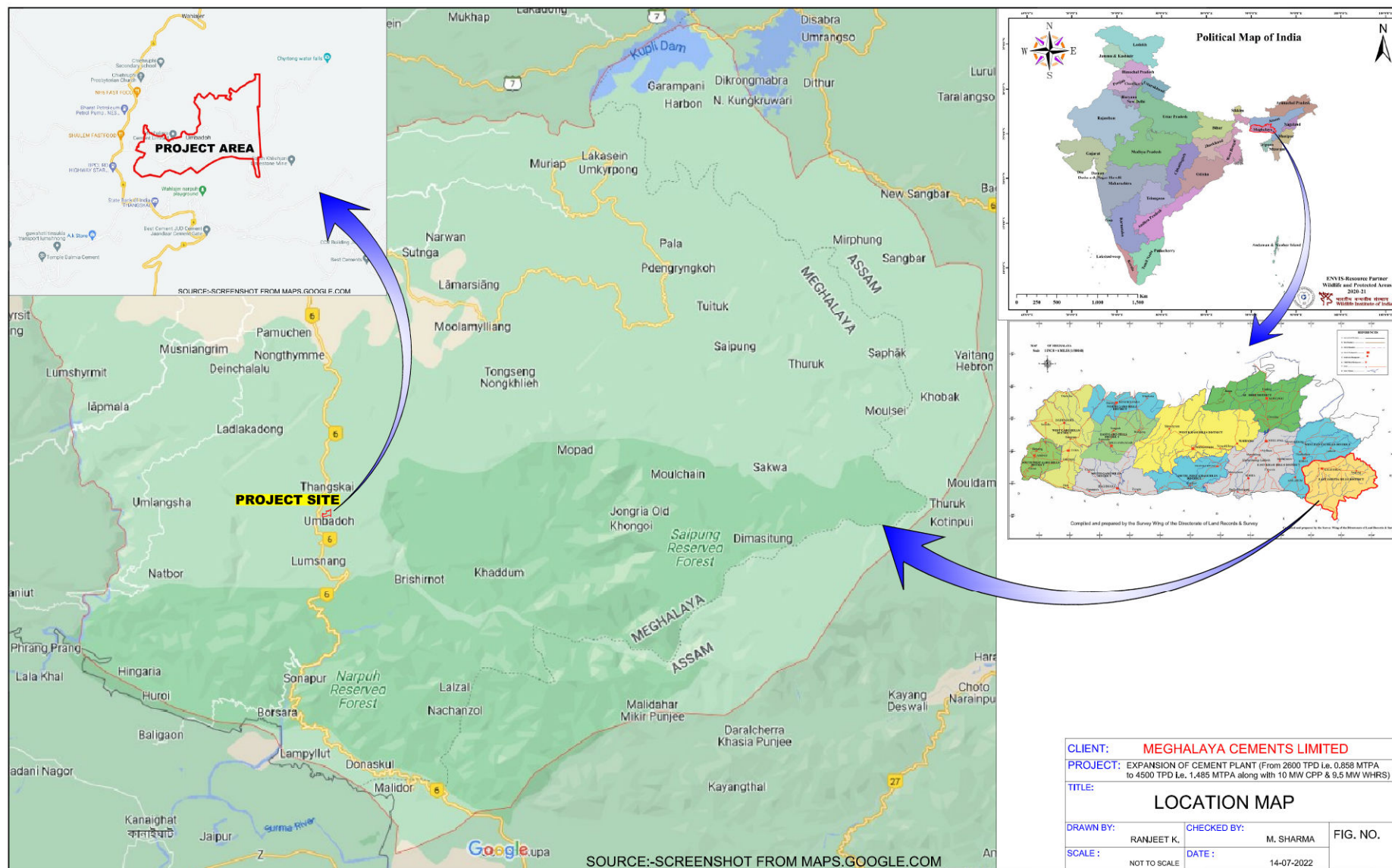
Total power requirement for 1.485 MTPA cement plant is estimated as 21 MW. It shall be sourced from State Electricity Board, Captive Power Plant and Waste Heat Recovery System.

The total water requirement for 1.485 MTPA cement plant will be 2489 KLD. It is being and shall be sourced from Chynryntong- Umparti River for which a permission was taken from the Department of Irrigation.

2.4 Manpower

The existing manpower of the plant is 1358 consisting of 376 (direct employees) and 982 (indirect employees). Additionally 120 persons (direct 20 and indirect 100) shall be required for the expansion phase of the project.

FIG 1: LOCATION MAP OF THE PROJECT



The manpower requirement is and will be for various activities of the plant like plant operation, loading, unloading, handling, transportation, general cleaning, horticulture and other miscellaneous works inside the plant. The plant is and will operate for 330 days.

2.5 Site services

Infrastructure facilities such as administrative office, rest rooms, canteen, first aid centre, etc. are existing and will continue to be provided to employees.

3.0 PRESENT ENVIRONMENTAL SCENARIO

The project area has been referred to as the “core zone” while the area upto 10 km radius of the project has been referred to as the “buffer zone”. Together they comprise the “study area” which can be seen in **Fig 2**.

3.1 Topography and drainage

Topography: The topography of the core zone is hilly. The average elevation of the core zone varies from 731 in south-west to 799 meter above mean sea level (m amsl) in north-west portion, based on Google Earth. The study area has hilly terrain having uneven land. The surface elevation in buffer zone varies from 32 to 1047 m amsl based on Google Earth.

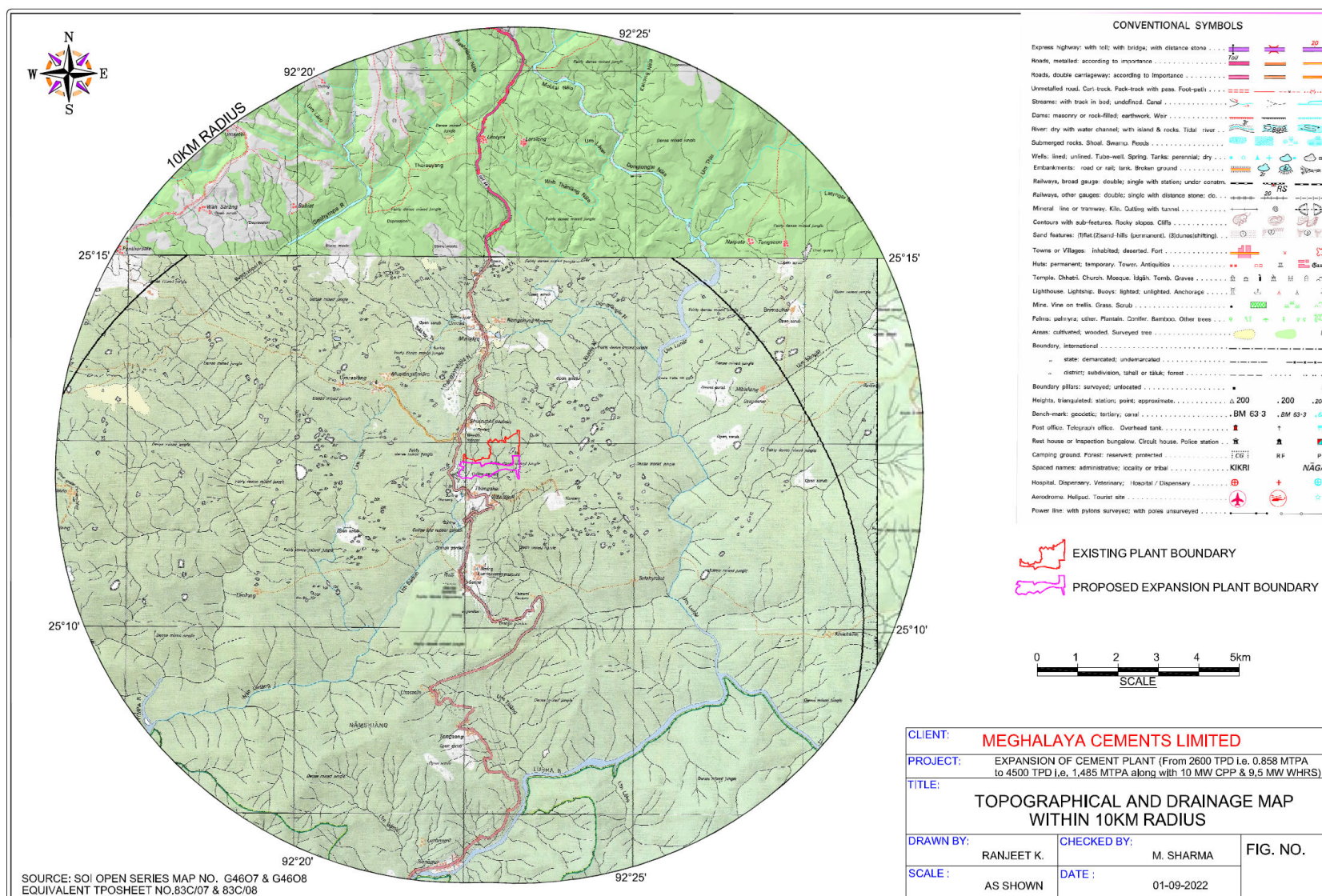
Drainage: There is no perennial water body present in the project area. Only three seasonal drains exist. The main drainage of the study area is controlled by the Lukha River. It is located at 6.9 km south east of the plant. Lukha is fed by Um Lunar river (3.6 km, east), its main tributary as well as numerous streams from the hills of the Narpuh Reserve Forest. There are total 28 seasonal and perennial streams and rivers in 10 km of radius.

3.2 Climate and micro-meteorology

The climate of region is mainly sub-tropical type. Monthly average of minimum temperatures recorded at IMD station Shillong from 1981-2010, ranges from 5.9 to 17.9 degree celsius and maximum temperature ranges from 14.9 to 24.1 degree celsius. Total of average monthly rainfall is 2250.4 milimeter.

The micro meteorological data of the core zone has been recorded using an automatic weather station from 1st March to 31st May 2022. The temperature ranged between 11.58 to 20.95 degree celsius and relative humidity ranged between 44.40 to 91.30% during the monitoring period. The wind speed varied between 0.11 to 21.29 km/hr. The predominant wind direction was observed from south west with 23.96% of occurrences.

FIG 2: TOPOGRAPHY AND DRAINAGE MAP OF THE STUDY AREA



3.3 Ambient air quality

Ambient air quality study was monitored at 8 locations including one location in the core zone. Seven locations in the buffer zone are near Mine area (at lime plant), Khliejhari mine (near magazine), NE of Thangskai village, Umlong village, Wahiajer village, Chiehruphi village and Myngkre. Twenty four hour average PM_{10} level was found to range from 40.3 to 75.0 $\mu g/m^3$, $PM_{2.5}$ was found to vary from 23.3 to 46.0 $\mu g/m^3$, SO_2 from BDL to 13.1 $\mu g/m^3$ and NO_2 from 6.6 to 15.2 $\mu g/m^3$. Concentration of PM_{10} and $PM_{2.5}$ is within the permissible limit at all the locations. The concentrations of SO_2 and NO_2 are considerably low compared to the 80 $\mu g/m^3$ NAAQS permissible limit for residential, rural and other areas.

3.4 Water resource and quality

The main drainage of the area is controlled by the Lukha River. It is located at 6.9 km south east of the plant. There are 28 seasonal and perennial streams and rivers in 10km radius. Springs are also common in the hills.

Ground water: Water samples were collected from 3 ground water sources. These were (1) Lumshnong Village (2) Chiehruphi Village and (3) Thangskai village.

Surface water: Water samples were collected from 8 surface water sources. These were (1) Um Lunar river upstream, (2) Um Lunar river downstream, (3) Tributary of Um Lunar river, (4) Um Utha river, (5) River near Sonapur village, (6) Seshympa river near Amrit Cement Plant, (7) Um Badoh nala, (8) Reservoir in existing plant.

It was observed that the physico-chemical parameters present in ground water and surface water were within the permissible limits specified by IS: 10500:2012 for drinking purposes in absence of alternate source.

3.5 Land use pattern and soil quality

Existing project area is 52.949 ha. Additional land requirement for expansion is 41.251 ha. Thus, total land required for the project is 94.20 ha. Entire 94.20 ha land is in possession of the Company.

The study area has 30 villages. As per satellite imagery interpretation, 0.11% is built-up land, 0.70% is agriculture land, 82.78% is vegetated land, 10.78% is waste land, 0.82% is water body and 4.81% is others.

Top soil samples were collected and analyzed from 7 locations in and around plant premises. The results indicate that all the soil samples are fine and medium grained sand and have pH between 6.6-8. Organic carbon is optimum in soil.

3.6 Noise and traffic volume survey

Noise levels at eight stations (1 within the core area and seven within buffer area) were observed. Leq values observed during day time varied from 47.42 to 70.04 decibel (A) and at night time varied from 35.94 to 62.37 decibel (A). The traffic volume survey was conducted round the clock at 2 locations on 12-13/04/2022 i.e. NH-6 near Myngkre (T1) and on 14-15/04/2022 at NH-6 near Tongseng (T2). Total number of equivalent passenger car units were found as 8,857 and 11,450, respectively.

3.7 Ecology

No forest land is present within the existing area and proposed expansion area. The nearest Wildlife Sanctuary is Narpuh WL Sanctuary. Its eco sensitive zone (ESZ) is at a distance of 5.8 km in south east. The project area lies outside the notified eco-sensitive zone. There are two reserved forests present within 10 km radius of the project namely, (1) Narpuh Reserved Forests Block I (9 km) and (2) Narpuh Reserved Forests Block II (8.1 km). In core zone, a total of 45 flora species such as trees, herbs, shrubs & climbers are found in the core zone. Flora in the study area comprises 54 species of terrestrial plants and 50 species of shrubs, herbs and climbers.

Fauna in the core zone is less as compared to buffer area. Avifauna includes Red Vented Bulbul, Black Drongo, Long-tailed Broadbill, Mountain Bamboo Partridge, Khalij Peasant and House Sparrow; Mammals include Black Rat, Bat, Indian Grey Mongoose, Lesser Bamboo Rat, Bat & squirrel and amphibian includes green frog. A total of 32 terrestrial fauna species recorded in the study area comprises 16 mammals, 3 reptiles, 9 aves, 3 amphibians and 1 rodent.

3.8 Socio-economic conditions

There is no habitation within proposed expansion area. Thus, no resettlement and displacement of habitation shall be there. Some of Company's own buildings/ sheds are existing within the expansion area.

There are 30 villages in the buffer zone of the study area. As per Census 2011, total population within the study area is 10965 persons that include 5530 males and 5435 females.

The SC population is 0.10% and ST population is 98.37%. The average literacy rate is 46.29%. The literacy among women is 23.20%. 30.02% of the total population are main workers, while 6.05% are marginal workers and the rest 63.93% are non workers.

3.9 Places of archaeological/ historical/ tourist/ religious importance

There is no notified Archaeological Survey of India place in the study area. There are few places of tourism within the study area such as one Khaddum

Shympe Water Fall at a distance of 6.6 km south east, Narpuh Wildlife Sanctuary at a distance of 7.1 km in south east from the plant boundary. Around 5 km from the site, there are ancient caves named as Lumshnong cave which lie in the southern direction from the plant. There are few village churches such as The Presbyterian Church in Thangskai, Church of God (M&A) in Wahiajer, Chiehruphi Presbyterian Church, etc.

3.10 Industries around the project area

In addition to Meghalaya Cement Ltd., there are 7 industries present within 10 km radius of the study area namely CMCL - Star Cement, Jud Cement Ltd., Dalmia Bharat Cement Limited, Goldstone Cements Limited, Hills Cement Company Limited, Max Cement Limited (Green valley) and Amrit Cement Company Limited.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION

4.1 Topography and drainage

Impact: Since the plant is already under operation, change in topography is occurring only in core zone (existing and expansion). This is due to cutting, filling and construction of the additional plant area, shed area, truck parking, others (maintenance area, drains), etc. The topography will change permanently due to leveling and establishment of various units. The construction once achieved will not be reversed. There will be no impact on topography of the buffer zone since no construction is proposed outside the core zone.

Mitigation: The change in topography in the core zone will be permanent and irreversible. Excavated soil will be used in leveling, filling and landscaping to minimise the impact of change in topography. Changes in the sheet flow pattern of rain water will be managed through storm water drains. The impact of the new construction will, therefore, be managed through mitigation measures.

4.2 Climate & Meteorology

Impact: Regional variables and the monsoon influence the climatic conditions, which include temperature changes, wind direction and speed, rainfall, and humidity. As most of the civil and mechanical work would be related to erecting the plant, the projected expansion plant development will have a little influence on the weather throughout the construction phase. Fossil fuels will be used during the operation phase to produce goods as well as to transport finished goods and raw materials.

Mitigation: Development of greenbelt in existing and additional area shall contribute in a positive manner towards mitigation of greenhouse gases. The trees planted over life of cement plant will help sequester carbon. The company will also undertake measures to minimise the CO₂ emissions.

4.3 Air quality

Impact: During construction phase, sources of air pollution will be due to vehicle exhausts, excavation work, construction material handling (cement, sand and gravel), vehicle movement on unpaved roads and exhaust from non-mobile construction equipment like compressors. During operation phase, the air quality impact will be high and that is due to emissions from the stacks attached to various units and from transportation. Each of these has been evaluated for potential impact using mathematical models.

Mitigation: During construction, dust is anticipated due to leveling, construction and transportation activities. It is being and will be controlled by sprinkling of water and using covers. Construction equipment and transport vehicle will be maintained periodically as per manufacturers / government norms. All trucks that are and will be used for transportation of construction material, raw material and finished product will be covered with tarpaulin. The air quality prediction exercise was carried out for stack emissions. The incremental ground level concentrations on expansion from 2600 TPD to 4500 TPD for normal operation has been calculated as 1.312 $\mu\text{g}/\text{m}^3$ for PM10, 0.283 $\mu\text{g}/\text{m}^3$ for PM2.5, 21.465 $\mu\text{g}/\text{m}^3$ for SO_2 and 15.7 $\mu\text{g}/\text{m}^3$ for NO_2 . The impact of the plant expansion will remain within permissible limits.

4.4 Noise and traffic density

Impact: The noise level during construction will be due to construction machinery. It will be temporary in nature. During operation, noise will be generated due to operation of various equipment, machinery, etc.

Mitigation: The equipment are and shall be provided with acoustic shields or enclosures to limit the sound level within the plant boundary. Maintenance of machinery and vehicles is and will be done regularly. The existing and proposed green belt will also help to prevent noise generated within the plant from spreading beyond the plant boundary. Ear muffs or plugs are and will be provided to the workers in close vicinity of noise source.

4.5 Water environment

Impact: During construction phase, water will be required for concrete mixing, curing, sprinkling for dust suppression, irrigation for green belt and lawns. During operation phase, the requirement of water will be for process and sourced from Chynryntong-Umparti River. 382.8 KLD waste water will be generated after expansion from cement plant, captive power plant, waste heat recovery system and domestic usage.

Mitigation: During construction phase, the sewage from site office and labour camps will be treated in existing sewage treatment plant. During operation, entire waste water generated shall be reused directly for dust suppression on road & parking and watering of green belt. At all department offices, CCR, workshop, administrative offices, canteen, clinic etc there will

be separate toilets. Waste water from these areas will be treated in sewage treatment plant as well as in septic tanks in distant parts of the plant.

4.6 Land use

Impact: The total plant area is 94.20 ha. It comprises of Plant Area, Captive Power Plant area, Shed Area, Colony Area, ABCD Residential Area, Road area, Truck Parking, Greenbelt / Plantation and Others (maintenance area, drain, play ground, park, etc.) During expansion, additional buildings and sheds of the new units will come up along with facilities.

Mitigation: The land use shall be industrial land use and will comprise of the break as explained above. This will be a permanent and irreversible change. Some of Company's own buildings/ sheds are existing within the expansion area may be repaired, retrofitted or dismantled to replace or remove, if required.

4.7 Soil quality

Impact: Top soil erosion and contamination can occur both during construction and operation. Removal and rehandling of top soil will also affect its fertility.

Mitigation: The topsoil shall be removed prior to commencement of construction. It will be preserved and shall be spread over the area where additional plantation is proposed. Plantation will be carried out at earliest to minimise soil erosion. To prevent contamination of water and soil, the raw material and finished products will be stored in covered sheds with impervious base. To improve quality of top soil, organic manure shall be used along with planting a mix of species, including nitrogen fixing plants.

4.8 Solid waste

Impact: During construction phase, due to work force deployed for construction, there will be development of temporary establishment of residential and commercial nature. In operation phase, there shall be dust from bag filters and electrostatic precipitator. There will be fly ash from captive power plant. There will be biodegradable wastes from the canteen. Sludge will be generated from septic tanks and sewage treatment plant (of adjoining colony). Hazardous waste such as used oil shall also be generated.

Mitigation: The material collected in the bag filter and electro static precipitator shall be reused for cement manufacturing. Hence, there shall not be any disposal. Fly ash from captive power plant shall be used for cement manufacturing. Biodegradable waste from canteen shall be composted and used as manure. Sludge from sewage treatment plant (from adjoining colony) and septic tanks within plant area will be utilized as manure for green belt development within the plant premises. Used oil (Hazardous Waste) will be sold to CPCB authorised recyclers.

4.9 Ecology

Impact: There is no forest land involved in the project area (existing and expansion). 17.48 ha (33%) of the existing plant area is already under the green belt area.

Mitigation: Under the proposed green belt and plantation programme after expansion, 31.086 ha of land within premises (33% of total area) shall be provided with green cover. Plantation for the additional 13.606 ha green belt has been started and will be completed in next 2 years. The greenbelt will act as a micro-habitat for small sized mammals and birds. The Wildlife Conservation Plan is being prepared for general protection of animals found in buffer zone. Mitigation measures shall be followed as per Wild Life Conservation Plan.

4.10 Socio-economics

Impact: No family shall be displaced for the proposed expansion of Cement Plant. Most of the work force required for construction and operation of the proposed expansion project will be drawn from the surrounding areas. The colony is having other facilities like primary health center, community hall, recreation center & shops, guesthouse, school, etc.

Mitigation: It is proposed to hire the manpower locally in the proposed plant, to the extent possible in order to have a positive socio-economic impact. For the purpose, training for capacity building shall be undertaken by the company. Other than direct and indirect employment leading to economic growth, the major benefit to the community will be through social welfare measures.

4.11 Occupational Health

Productivity and a positive working relationship between the employer and the employees are very closely tied to occupational safety and health. The Company have qualified engineers, safety officer, Deputy Manager (Environment) and other statutory manpower. There is a first aid room and the required medications are obtained in accordance with standards. The same personal protective equipment that is offered to the current workers will also be made available to the additional workers. The responsibility for managing the safety component falls to the Deputy General Manager (Safety). For the safe handling of materials and machines, regular training will be given. The company is making and will continue to make every effort to have zero accidents.

5.0 ANALYSIS OF ALTERNATIVES

Meghalaya Cements Limited already has an environmental clearance of 2600 TPD dated 25.03.2009. Even though this is an operational plant, three alternatives sites were analysed for the project. The final chosen site is adjoining to existing plant and will share the resources and facilities of the

existing plant. In the existing and proposed expansion phase, dry process of cement manufacturing has been chosen as it offers more advantages, particularly in fuel consumption and water conservation.

It is also proposed that the available alternative fuels such as single use plastic, wood, tyre chips, permissible municipal waste (refuse derived fuel), spent oil, sludge and filter oil, mixed waste liquid, mixed waste solid, spent carbon, agro waste, carbon black, spent carbon, etc shall also be co-processed with coal as per the availability of alternate fuel within region.

6.0 ENVIRONMENTAL MONITORING PROGRAM

Meghalaya Cements Limited already has an Environment Management Department at the project level. It will also be responsible for ensuring the environmental monitoring of the proposed expansion plant. Monitoring of stack emissions, ambient air quality, water quality, water levels, noise levels, soil quality, tree count, etc. is being and shall be carried out periodically at plant level.

The Deputy Manager (Environment) is already appointed at the plant. The capital cost of environmental monitoring for expansion phase only has been worked out as Rs. 13.09 lakhs. The recurring cost of environmental monitoring for expansion phase only has been worked out as Rs. 12.37 lakhs.

7.0 ADDITIONAL STUDIES: DISASTER MANAGEMENT PLAN

All types of industries face certain types of hazards which can disrupt normal activities abruptly. They can lead to disaster like fires, inundation, failure of machinery, explosion, oil spillage, electrocution, etc. The aim of the disaster management plan is to take precautions; prevent hazard from occurring and avert disaster. It also plans for actions that are taken after a disaster occurs. This limits the damage to the minimum. To tackle a disaster situation, an emergency control room will be set up with communication facility. The emergency team shall be headed by the plant manager, who will be called Site Main Controller.

8.0 PROJECT BENEFIT

Presently 376 direct employees are there which will increase by 20 persons for expansion. Presently 982 indirect employees are there which will increase by 100 persons for expansion. Indirect employees will be engaged either on contract basis or in transportation of materials or in provision of different services associated with the project. As majority of unskilled and semi-skilled persons will be from the surrounding villages, social & infrastructural benefits will extend to the local population. Improvement is expected in education facilities, health care services and drinking water facilities through proposed social welfare measures.

9.0 ENVIRONMENT MANAGEMENT PLAN

Since this is an operational plant, an environmental management team is already in place to monitor and implement the environmental management programme. The environment management team is and shall be responsible for implementation of environment management plan, developing greenbelt, ensuring good housekeeping, statutory compliance as well as creating environmentally aware work forces. The parameter wise management plan comprises of following:

- Air quality management plan: provision of air pollution control equipment such as bagfilters and electrostatic precipitators connected to kilns and electrostatic precipitator connected to captive power plant, sprinkling on roads and material handling areas, green belt for absorption of pollutants.
- Noise quality management plan : plant machinery will be established in enclosed shed to prevent noise propagation to surrounding, DG set will have acoustic enclosure, boundary wall and green belt will also mitigate noise.
- Solid waste and hazardous waste management plan: The material collected (including fly ash) in the bag filter and electrostatic precipitator shall be reused for cement manufacturing. Biodegradable waste from canteen shall be composted and used as manure. Sludge from sewage treatment plant (from adjoining colony) and septic tanks within plant area will be utilized as manure for green belt development within the plant premises. Used oil (Hazardous Waste) will be sold to CPCB authorised recyclers.
- Effluent management plan: The entire waste water generated from the cement plant shall be reused directly for dust suppression on road & parking and watering of green belt.
- Storm water management plan: There is rain water harvesting system in existing plant to harvest the runoff water. Excess rain water from the expansion area will be collected through storm water drainage system.
- Occupational health and safety management plan: Pre-induction and during employment monitoring of occupational health is and shall be carried out as per Factories Act 1948 and Meghalaya Factories Rules 1980. First aid room with necessary medicines is already maintained as per norms. Personal protective equipment is and will be provided to workers. Regular training is and shall be provided for safe handling of material and machines. Company shall put 100% efforts for a zero accident rate.
- Green belt development plan: Under the proposed green belt and plantation programme after expansion, total 31.086 ha of land within premises (33% of total area) shall be provided with green cover.

- Socio economic management plan: Social welfare measures to fulfill to the issues will be raised during public hearing.

The total investment for the proposed expansion project is Rupees 168.08 lakhs. The environmental management cost for the entire project shall be Rs. 2596.74 lakhs capital cost and Rs. 28.121 lakhs/ annum recurring cost. This includes monitoring cost.

10.0 DISCLOSURE OF CONSULTANTS

The consultants engaged for the preparation of the EIA/EMP of the project is Min Mec Consultancy Pvt. Ltd. It was registered in July 1983 with the Registrar of Companies, Delhi & Haryana, India. In 1994, Min Mec established a modern R&D Laboratory. Min Mec is ISO 9001: 2015 certified under ANZ-JAS. In June 2006, the laboratory received accreditation from NABL, which has been renewed as per procedure since (latest certificate no. TC-6337 valid upto 16.03.2024). In 2012, lab had been recognized under Environment Protection Act (EPA) by Ministry of Environment, Forest & Climate Change, Government of India and has been renewed till 2024. On 25.02.2021, Min Mec Consultancy was accredited by QCI-NABET as Mine Plan Preparing Agency (MPPA). Min Mec was accredited as EIA Consultant Organisation by NABET in July 2022 vide Accreditation Certificate No. NABET/EIA/2225/IA 0096 valid upto 29.03.2025.

11.0 CONCLUSION

The analysis of the cost benefit shows that the project will be profitable after taking into the accounts of all requisite environmental management cost. The cost effectiveness analysis in terms of topography, drainage, climate, ambient air quality, water resource, water quality, noise level, traffic volume, land environment, soil quality, ecology and socio-economics shows that the project will have an overall positive impact.